

glass, and a line distant from each other." ^x I cannot,, how-
ever, find any record of such an observation by either Walsh or Ingenhousz, and do not know where to refer to that by M. Fahlberg. M. Humboldt could not himself perceive any luminous effect.

Again, Sir John Leslie, in his dissertation on the progress of mathematical and physical science, prefixed to the seventh edition of the *Encyclopedia Britannica*, Edinburgh, 1830, p. 622, says, " From a healthy specimen " of the *Silurus electricus*, meaning rather the *gymnotus*, " exhibited in London, vivid sparks were drawn in a darkened room; " but he does not say he saw them himself, nor state who did see them; nor can I find any account of such a phenomenon; so that the statement is doubtful.²

95. In concluding this summary of the powers of torpedinal electricity, I cannot refrain from pointing out the enormous absolute quantity of electricity which the animal must put in circulation at each effort. It is doubtful whether any common electrical machine has as yet been able to supply electricity sufficient in a reasonable time to cause true electro-chemical decomposition of water (66, 75), yet the current from the torpedo has done it. The same high proportion is shown by the magnetic effects (32, 107). These circumstances indicate that the torpedo has power (in the way probably that Caven-dish describes) to continue the evolution for a sensible time, so that its successive discharges rather resemble those of a voltaic arrangement, intermitting in its action, than those of a Leyden apparatus, charged and discharged many times in succession. In reality, however, there is *no philosophical difference* between these two cases.

96. The *general conclusion* which must, I think, be drawn from this collection of facts is, that *electricity, whatever may be its source, is identical in its nature*. The phenomena in the five kinds of species quoted, differ, not in their character but only in degree; and in that respect vary in proportion to the variable circumstances of *quantity* and *intensity*³ which can at pleasure be made to change in almost any one of the kinds of electricity, as much as it does between one kind and another.

¹ *Edinburgh Phil. Journal*, ii. p. 249.

² Mr. Brayley, who referred me to these statements, and has extensive knowledge of recorded facts, is unacquainted with any further account relating to them.

³ The term *quantity* in electricity is perhaps sufficiently definite as to sense; the term *intensity* is more difficult to define strictly. I am using the terms in their ordinary and accepted meaning.